

WHAT IS CLAIMED IS:

1. A method for performing an operation in a well comprising:
  - 5 providing a first device in the well which is uniquely identified and located at a known depth in the well;
  - providing a second device configured to locate the first device in the well;
  - transporting the second device through the well; and
  - 10 controlling the operation responsive to the second device locating the first device.
2. The method of claim 1 further comprising transporting a process tool through the well with the second device and  
15 controlling the process tool responsive to the second device locating the first device.
3. The method of claim 1 wherein the first device comprises a radio identification device.  
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4. The method of claim 1 wherein the second device comprises a radio frequency transmitter configured to provide a transmission signal for reception by the first device and a receiver configured to receive a response signal from the first device.  
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5. The method of claim 1 wherein the operation comprises a process selected from the group consisting of perforating processes, packer setting processes, bridge plug setting processes, logging processes, inspection processes, chemical treating processes, casing patch processes, jet cutting processes and cleaning processes.  
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6. A method for performing an operation in a well comprising:
  - 35 providing a first device at a known depth in the well configured to transmit a signal which identifies the first device;

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providing a second device configured to receive the signal and to control the operation upon reception of the signal;

transporting the second device through the well proximate to the first device; and

5 controlling the operation responsive to reception of the signal by the second device.

7. The method of claim 6 wherein the second device comprises a receiver for receiving the signal and a transmitter for transmitting a second signal to the first device.

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15 8. The method of claim 7 further comprising transporting a process tool through the well with the second device and controlling the process tool using the signal to perform the operation.

9. The method of claim 8 wherein the process tool comprises a perforating tool and the signal initiates a perforating process using the perforating tool.

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25 10. The method of claim 8 wherein the process tool comprises a packer setting tool and the signal initiates setting of a packer element using the packer setting tool.

11. A method for performing an operation in a well comprising:

providing a process tool;

providing a plurality of spaced, uniquely identified identification devices in the well;

30 providing a reader device configured to read the identification devices and to transmit a control signal for controlling the process tool;

programming the reader device to transmit the control signal at a selected identification device;

35 transporting the process tool and the reader device through the well;

reading the identification devices using the reader tool; and

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transmitting the control signal at the selected identification device to control the process tool and perform the operation.

5        12. The method of claim 11 wherein the process tool comprises a perforating tool configured to form openings in the well.

10      13. The method of claim 11 wherein the process tool comprises a packer tool configured to seal a portion of the well.

15      14. The method of claim 11 wherein the process tool comprises a combination tool configured to perform multiple operations in the well.

20      15. The method of claim 11 wherein the transporting step is performed using a transport mechanism selected from the group consisting of wire lines, pumps, blowers, parachutes, coil tubing and tubing strings.

25      16. The method of claim 11 wherein the transporting step is performed by gravity.

30      17. The method of claim 11 wherein the operation comprises a process selected from the group consisting of perforating processes, packer setting processes, bridge plug setting processes, logging processes, inspection processes, chemical treating processes, casing patch processes, jet cutting processes and cleaning processes

35      18. A method for performing an operation in a well comprising:

providing a well casing comprising a plurality of radio identification devices located at spaced intervals along a length thereof;

determining a depth of each radio identification device within the well;

providing a process tool configured to perform the operation at a selected portion of the well casing proximate to a selected radio identification device;

5 providing a reader device configured to identify each radio identification device;

moving the process tool and the reader device through the well casing; and

10 controlling the process tool to perform the operation at the selected portion when the reader device is proximate to the selected radio identification device.

15 19. The method of claim 18 wherein the determining step comprises logging the well to provide a well log and ascertaining the depth using the well log.

20 20. The method of claim 18 further comprising establishing a record of the well using information from the determining step.

21. The method of claim 18 wherein the controlling step is 20 performed dynamically as the process tool moves through the well casing.

22. The method of claim 18 wherein the controlling step is 25 performed statically by stopping the process tool proximate to the selected radio identification device.

23. The method of claim 18 wherein the moving step is performed using gravity or a transport mechanism.

30 24. A method for performing a perforating operation in a well comprising:

providing a well casing comprising a plurality of couplings;

placing a plurality of radio identification devices in the couplings configured to transmit rf signals;

35 providing a perforating tool configured to form an opening in a selected portion of the well casing;

providing a reader device configured to receive the rf signals from the radio identification devices and to control the perforating tool responsive to the rf signals;

5 transporting the perforating tool and the reader device through the well casing; and

controlling the perforating tool using the reader device to form the opening.

25. The method of claim 24 further comprising spacing the  
10 perforating tool from the reader device by a selected distance.

26. The method of claim 24 further comprising detonating the perforating tool responsive to a control signal from the reader device.

15 27. The method of claim 24 further comprising detonating the perforating tool during the transporting step.

28. The method of claim 24 wherein the transporting step  
20 is performed using a transport mechanism.

29. The method of claim 24 wherein the transporting step is performed by free falling the perforating tool and the reader device through the well casing.

25 30. A method for performing a setting operation in a well comprising:

providing a well casing comprising a plurality of couplings;  
30 placing a plurality of radio identification devices in the couplings configured to transmit rf signals;

providing a setting tool configured to seal a selected portion of the well casing;

35 providing a reader device configured to receive the rf signals from the radio identification devices and to control the setting tool responsive to the rf signals;

transporting the setting tool and the reader device through the well casing; and

controlling the setting tool using the reader device.

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31. The method of claim 30 further comprising spacing the setting tool from the reader device by a selected distance.

5       32. The method of claim 30 wherein the setting tool comprises a packer setting tool comprising an inflatable packer element.

10      33. The method of claim 30 wherein the transporting step is performed using a transport mechanism.

15      34. The method of claim 30 wherein the transporting step is performed by free falling the setting tool and the reader device through the well casing.

15      35. The method of claim 30 wherein the setting tool comprises a bridge plug setting tool.

20      36. A method for performing a first operation and a second operation in a well comprising:

       providing a plurality of uniquely identified identification devices located at spaced intervals at known depths within the well;

25      providing a first process tool configured to perform the first operation;

       providing a second process tool configured to perform the second operation;

       providing a reader device configured to identify each identification device;

30      moving the first process tool and the second process tool with the reader device through the well;

       controlling the first process tool to perform the first operation when the reader device is proximate to a first identification device; and

35      controlling the second process tool to perform the second operation when the reader device is proximate to a second identification device.

37. The method of claim 36 wherein the first process tool and the second process tool are initially attached to one another and separated between the first identification device and the second identification device.

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38. The method of claim 36 wherein the well comprises a well casing the identification devices comprise radio identification devices on the well casing.

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39. The method of claim 36 wherein the reader device comprises a radio frequency transmitter configured to provide a transmission signal for reception by the identification devices and a receiver configured to receive response signals from the identification devices.

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40. The method of claim 36 wherein the first operation comprises a packer setting process and the second operation comprises a perforating process.

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41. The method of claim 36 wherein the first operation and the second operation comprise a process selected from the group consisting of perforating processes, packer setting processes, bridge plug setting processes, logging processes, inspection processes, chemical treating processes, casing patch processes, 25 jet cutting processes and cleaning processes

42. A method for performing a setting operation and a perforating operation in a well comprising:

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providing a setting tool configured to perform the setting operation and a perforating tool configured to perform the perforating operation;

providing a well casing comprising a plurality of radio identification devices located at known depths within the well;

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providing a reader device configured to receive rf signals from the radio identification devices and to control the setting tool and the perforating tool responsive to the rf signals;

transporting the setting tool, the perforating tool and the reader device through the well casing;

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controlling the setting tool to perform the setting operation when the reader device receives a first rf signal from a first radio identification device; and

5 controlling the perforating tool to perform the perforating operation when the reader device receives a second rf signal from a second radio identification device.

10 43. The method of claim 42 wherein the setting tool and the perforating tool are contained on a combination tool and are separated between the first radio identification device and the second radio identification device.

15 44. The method of claim 42 wherein the reader device is attached to the perforating tool during the transporting step.

45. A method for improving production in an oil or gas well comprising:

providing a first device at a known depth in the well configured to transmit a signal which identifies the first device;

20 providing a second device configured to receive the signal and to control an operation within the well upon reception of the signal;

transporting the second device through the well proximate to the first device; and

25 controlling the operation responsive to reception of the signal by the second device.

46. The method of claim 45 wherein the second device comprises a receiver for receiving the signal and a transmitter for transmitting a second signal to the first device.

30 35 47. The method of claim 45 further comprising transporting a process tool through the well with the second device and controlling the process tool using the signal to perform the operation.

48. The method of claim 47 wherein the process tool comprises a perforating tool and the signal initiates a perforating process using the perforating tool.

5       49. The method of claim 47 wherein the process tool comprises a packer setting tool and the signal initiates setting of a packer element using the packer setting tool.

10      50. A method for improving production in an oil or gas well comprising:

       providing a well casing comprising a plurality of radio identification devices located at spaced intervals along a length thereof;

15      determining a depth of each radio identification device within the well;

       providing a process tool configured to perform an operation at a selected portion of the well casing proximate to a selected radio identification device;

20      providing a reader device configured to identify each radio identification device;

       moving the process tool and the reader device through the well casing; and

25      controlling the process tool to perform the operation at the selected portion when the reader device is proximate to the selected radio identification device.

30      51. The method of claim 50 wherein the determining step comprises logging the well to provide a well log and ascertaining the depth using the well log.

35      52. The method of claim 50 further comprising establishing a record of the well using information from the determining step.

       53. The method of claim 50 wherein the controlling step is performed dynamically as the process tool moves through the well casing.

54. The method of claim 50 wherein the controlling step is performed statically by stopping the process tool proximate to the selected radio identification device.

5 55. The method of claim 50 wherein the moving step is performed using gravity or a transport mechanism.

56. A system for performing an operation in a well comprising:

10 a process tool configured for transport through the well; a plurality of radio identification devices located at spaced intervals at known depths in the well configured to transmit response signals for uniquely identifying each radio identification device; and

15 a reader device configured for transport through the well for receiving the response signals from the radio identification devices and for controlling the process tool responsive to the response signals.

20 57. The system of claim 56 wherein the reader device is attached to the process tool.

25 58. The system of claim 56 further comprising a transport mechanism configured to move the process tool and the reader device through the well.

30 59. The system of claim 56 wherein the reader device comprises a receiver for receiving the response signals and a transmitter for transmitting transmission signals to the radio identification devices.

35 60. The system of claim 56 wherein the process tool comprises a perforating tool and the control signal controls a perforating process.

61. The system of claim 56 wherein the process tool comprises a packer setting tool and the control signal controls setting of a packer element.

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62. The system of claim 56 further comprising a computer in signal communication with the reader device comprising a visual display generated using signals from the reader device.

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63. A system for performing an operation in a well comprising:

a well casing comprising a plurality of tubular elements joined by casing couplings;

10 a process tool configured for transport through the well casing;

a plurality of radio identification devices located on the couplings and configured to transmit response signals; and

15 a reader device attached to the process tool and configured to receive the response signals from the radio identification devices and to transmit control signals for controlling the process tool.

20 64. The system of claim 63 wherein the radio identification devices comprise radio identification devices.

25 65. The system of claim 63 wherein the reader device comprises a radio frequency transmitter configured to provide a transmission signal for reception by the radio identification devices and a receiver configured to receive the response signals.

66. The system of claim 63 wherein the process tool is configured for transport through the well casing by gravity.

30 67. The system of claim 63 further comprising a transport mechanism for transporting the process tool and the reader device through the well casing.

35 68. The system of claim 63 wherein the transport mechanism comprises a mechanism selected from the group consisting of wire lines, pumps, blowers, parachutes, coil tubing and tubing strings.

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69. The system of claim 63 further comprising a computer in signal communication with the reader device comprising a visual display generated using the control signals.

5        70. A system for perforating a well casing comprising:  
            a perforating tool comprising a plurality of charge  
            assemblies;  
            a plurality of radio identification devices attached to the  
            well casing at spaced intervals at known depths in the well  
10        casing and configured to transmit rf signals;  
            a reader device attached to the perforating tool and  
            configured to receive the rf signals from the radio identification  
            devices and to control detonation of the charge assemblies  
            responsive to the rf signals; and  
15        a transport mechanism for transporting the perforating tool  
            and the reader device through the well casing.

20        71. The system of claim 70 wherein the well casing  
            comprises a plurality of collars and the radio identification  
            devices are attached to the collars.

25        72. The system of claim 70 further comprising a detonator  
            in signal communication with the reader device and configured to  
            detonate the charge assemblies.

25        73. A system for setting a ~~setting~~ tool in a well casing  
            comprising:  
            a plurality of radio identification devices attached to the  
            well casing at spaced intervals and known depths and configured  
30        to transmit rf signals;  
            a reader device attached to the packer tool and configured  
            to receive the rf signals from the radio identification devices and  
            to control the setting tool responsive to the rf signals; and  
            a transporting mechanism for transporting the setting tool  
35        and the reader device through the well casing.

74. The system of claim 73 wherein the well casing comprises a plurality of collars and the radio identification devices are attached to the collars.

5 75. The system of claim 73 wherein the setting tool comprises a packer setting tool.

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